ture and clothing, and may occasion the disease even after the lapse of months. Diphtheria attacks all classes, at all ages, and at all seasons of the year. By preference it attacks children and those who are debilitated from exposure to filth, dampness, or foul air from whatever source, When a case of diphtheria occurs in any family, the sick person should, if possible, be taken to a hospital; otherwise he should be placed in an upper room apart from the inmates of the house, and should be nursed, as far as possible, by one person only. The sick-chamber should be well warmed, exposed to sunlight, and well aired; its furniture should be such as will permit of cleansing without injury; and all extra articles, such as window and table drapery, woollen carpets, upholstered furniture, and all hangings, should be removed from the room during the sickness. The physician and nurse, as a rule, should be the only persons admitted to the room.

Visitors to the infected house should be warned of the presence of a dangerous disease therein, and children especially should not be admitted. All clothing removed from the patient or the bed should be at once placed in a solution of corrosive sublimate — two drams to the gallon of water, in a wooden vessel — by the nurse before being carried through the house or handled by any other person. They may be soaked in this fluid for a convenient time, and then boiled for one hour. It is better not to use handkerchiefs for cleansing the nostrils and mouth of the patient, but rather soft rags, which should be immediately thereafter burned. All vessels for receiving the discharges of the patients should constantly contain some of the disinfecting liquid. Water-closets and privies in the house should be disinfected daily with a solution of fresh chloride of lime (half a pound to the gallon of water). Every kind and source of filth in and around the house should be thoroughly removed, and disinfectants freely used. Cleanliness tends both to prevent and mitigate the disease. Drains should be put in perfect order and ventilated by a four-inch straight pipe extended above the highest point of the roof of the house in every instance, terminating at a distance from any chimney or other ventilator. Children in the family should not attend school or mingle with other children until the patient has wholly recovered and all infected articles have been disinfected, and these facts certified by a responsible physician.

On the recovery, removal, or death of the patient, the most thorough disinfection should follow. Close up all apertures in the room tightly; hang up, unfolded, all articles of bedding, clothing, etc.; remove all mattress-covers for the free exposure of their contents; place in an iron pan four pounds of brimstone for each thousand cubic feet of space in the room; place the pan on two bricks or an iron rest in a tub containing water; pour a little alcohol on the brimstone, ignite it with a match, and leave the room closed tightly and guarded for not less than ten hours. The fumes of burning brimstone are dangerous to breathe, and will kill animals and plants. After fumigating has been done, the room and every thing in it should be thoroughly aired. The walls and ceilings should be brushed, and the floors and other wood-work washed with water containing two drams of corrosive sublimate to the gallon of water, and all vessels and utensils used in the room should be thoroughly washed with the same solution. All wash-bowls, water-closets, sinks, and slop-hoppers should be washed with a solution of chloride of lime (one half-pound to the gallon of water). When death occurs, the body should be immediately placed in the coffin, wrapped in a sheet saturated with a solution of corrosive sublimate (two drams to the gallon of water), and the coffin tightly and finally closed. No public funeral should ever take place at the house where the patient died, or elsewhere, unless the coffin remains hermetically sealed. Corrosive sublimate is a poison.

NORMAL MICROBES IN THE HUMAN STOMACH. — M. Abelous recently communicated to the Académie des Sciences the results of an investigation of the microbes of his own stomach. He succeeded in obtaining and studying no less than sixteen separate and distinct species. Of this number, seven have already been described, while nine appear to be new ones. The known ones are *Sarcina ventriculi*, *Bacillus pyocyaneus*, *Bacterium lactis aërogenes*, *B. subtilis*, *B. mycoïdes*, *B. amylobacter*, and *Vibrio rugula*. One of the unknown species was a coccus; the others were bacilli. Especial interest attaches to the function which Abelous believes these micro-organisms perform in connection with digestion. Thus he found that 10 attack albumen, 12 fibrine, 9 gluten, 10 cause the more or less complete transformation of lactose into lactic acid, and 13 form variable quantities of glucose from starch.

ANATOMICAL AND PHYSIOLOGICAL MEMORANDA. — The following anatomical and physiological memoranda, which we copy from the *New York Medical Record*, will be of interest to our readers, and serve a useful purpose as a matter of reference: "In each respiration an adult inhales one pint of air. Man respires sixteen to twenty times a minute, or twenty thousand times a day; a child, twenty-five to thirty-five times a minute. While standing, the adult respiration is twenty-two; while lying, thirteen. The superficial surface of the lungs, i.e., of their alveolar spaces, is two hundred square yards. The amount of air inspired in twenty-four hours is ten thousand litres (about ten thousand quarts). The amount of oxygen absorbed in twenty-four hours is five hundred litres (744 grams); and the amount of carbonic-acid gas expired in the same time, four hundred litres (911.5 grams). Two-thirds of the oxygen absorbed in twenty-four hours is absorbed during the night-hours from 6 P.M. to 6 A.M. Three-fifths of the total CO_2 is thrown off in the day-time. The pulmonary surface gives off one hundred and fifty grams of water daily in the state of vapor. An adult must have at least three hundred and sixty litres of air an hour. The heart sends through the lungs eight hundred litres of blood hourly, and twenty thousand litres, or five thousand gallons, daily. The duration of inspiration is five-twelfths, of expiration seven-twelfths, of the whole respiratory act. During sleep, inspiration occupies ten-twelfths of the respiratory period."

LIME-BURNERS FREE FROM CONSUMPTION. — It is said that lime-burners are free from consumption. Halter has observed this in the Lengerich kilns. The temperature of the air inhaled at these kilns is 105° F. to 158° F., and to this Halter attributes the immunity of the lime-workers more than to any thing else. He recommends for the treatment of consumption the inhalation of dry air heated to from 248° F. to 374° F. His theory is that the development of the bacilli is prevented by this high temperature.

AUSTRALIAN RABBIT-PEST. — The experiment of introducing the virus of chicken cholera into Australia, with the object of exterminating the rabbits which have become such a plague in that country, has proved a failure.

RHEUMATISM. — Dr. Terc contributes to the *Wiener Medicinische Presse* a novel method of curing rheumatism. He observed, that, when rheumatic persons were stung by bees, the swelling which usually follows such stings was very slow in appearing, and, if the persons were stung repeatedly, it did not appear at all; the result of such continued stinging being to cure the rheumatism, which showed no tendency to recur. He followed out this idea in the cases of 173 persons, 39,000 stings being required. Both acute and chronic cases were cured by this treatment.

ELECTRICAL NEWS.

The Discharge of a Leyden Jar.

DURING the past year, Professor O. J. Lodge has experimented and written a great deal on the subject of lightning-conductors. He has taken up the subject of electrical discharges, and has shown that many of our notions on the subject require modification. But the experiments he has made have been necessarily on a small scale, and, in applying his results directly to the problem of protection from lightning-discharges, he may be greatly in error. Still he has called attention to and stimulated inquiry on a subject of vital importance, and his work is already bearing fruit in the investigations begun by a number of other workers.

On March 8, Professor Lodge delivered a lecture at the Royal Institution of Great Britain, on the discharge of a Leyden jar. When such a jar is charged with electricity, and then the two coatings are discharged by connecting them by a short, thick wire, the result is not a single current of electricity along the wire in one direction, but the current passes back and forth, its intensity diminishing until it finally dies away and the jar is fully discharged.

This oscillation of the current was first observed by Joseph Henry, in 1842. He found that when the wire joining the two coatings of the jar was bent into a helix, and a needle placed inside, the magnetization of the needle due to the discharge-current was not always in the right direction. Henry stated that "the phenomenon requires us to admit the existence of a principal discharge in one direction, and then several reflex actions backward and forward, each more feeble than the preceding, until equilibrium is obtained." Later, Thomson worked out a mathematical theory of the subject, which agreed with Henry's observations; and further experiments have substantiated the results

Professor Lodge showed experimentally, but on a small scale, a case of the resonance of two Leyden-jar discharges, by causing sparks in one circuit by the discharge of a jar in a neighboring one. Another interesting experiment was the rendering audible of a Leyden-jar discharge as a musical note. The period of the oscillation in an ordinary discharge is many million vibrations a second. But this can be reduced in two ways, — by adding to the capacity of the circuit; or by increasing its self-induction, as one would increase the flexibility of a spring, and then load it in order to increase its period. On adding more jars, and on increasing the self-induction of the circuit by putting in a coil of wire, the period was reduced until a shrill whistle resulted from the discharge; on adding another coil, the one lowered again until the pitch was about that of the highest note of a piano; another coil brought it down to the octave above the middle C. The noise of the spark which is ordinarily heard is due to the sudden heating of the air. If the heat is oscillatory, the sound will be oscillatory too; and, by reducing the period of the electric oscillation, we bring the sound within the limit of audibility. On analyzing the spark that produced the lowest note, by means of a rotating mirror, a coarsely serrated band was seen. Another interesting experiment was tried with the jar discharge. If a polarized ray of light be passed through a piece of heavy glass around which a current is passed, the plane of polarization is rotated. Instead of a steady current, Professor Lodge used the oscillatory current from the jar; and a similar effect was obtained, even when the period was less than one seventy-thousandth of a second.

In concluding, Professor Lodge said, "The present is an epoch of astonishing activity in physical science. Progress is a thing of months and weeks, almost of days. The long line of isolated ripples of past discovery seem blending into a mighty wave, on the crest of which one begins to discern some oncoming magnificent generalization. The suspense is becoming feverish, at times almost painful. One feels like a boy who has been long strumming on the silent keyboard of a deserted organ, into the chest of which an unseen power begins to blow a vivifying breath. Astonished, he now finds that the touch of a finger elicits a responsive note; and he hesitates, half delighted, half affrighted, lest he be deafened by the chords which it would seem he can now summon forth almost at will."

A NEW ALLOY. — A new alloy has been made by Herr Reith of Bockenheim, Germany, which is said practically to resist the attack of most acid and alkaline solutions. Its composition is as follows: copper, 15 parts; tin, 2.34 parts; lead, 1.82 parts; antimony, 1 part. The alloy is therefore a bronze with the addition of lead and antimony. The inventor claims that it can be very advantageously used in the laboratory to replace vessels or fittings of ebonite, vulcanite, or porcelain.

A SERIES ELECTRIC TRAMWAY IN ENGLAND. — There has recently been tried, near the Northfleet Station of the South-Eastern Railway in England, an experiment on a system of electric traction, which, in its practical realization, has been imported from the United States. Indeed, it is curious that while the English technical papers claim with some pride that the work is a "distinctly English invention, due to the late Professor Jenkin and Professors Ayrton and Perry," yet the invention apparently lay dormant until it was practically worked out by two Americans, — Short and Nesmith, — applied on an extended scale in the United States, and finally introduced into England by the corporation controlling their patents. The track used for the trial seems to be considered a specially difficult one, since it has on it a three-per-cent grade four hundred yards long; but if we compare it with the average line in this country, where eight and even ten per cent grades are the rule rather than the exception, it would seem a very easy trial. The car was propelled by a single motor, sleeved to the axle and flexibly suspended, according to the system introduced by Sprague. Current was supplied from a conductor carried in a conduit. The novel feature of the system lies in the fact that the cars are worked in "series" instead of in "parallel." This necessitates the interposition of the motors into the main line; and to effect this a special device is needed. In the main line, in the centre of the conduit, are a number of contacts made by two plates normally held together by springs. If these plates were pulled apart, the main circuit would be broken, unless at the same time some conducting circuit is joined across them. Attached to the car, and travelling in the conduit, is a long "arrow." There are metallic strips on either side of the "arrow," and between these strips is joined the circuit of the motor. As the car moves along, the "arrow" passes between the contact-plates, forcing them apart, and thereby introducing the motor into the main circuit. On passing through a distance equal to the length of the "arrow," another set of contact-plates is forced apart, while the set which is left closes, thus keeping the circuit intact. On the trial the system worked well, and every one was well satisfied, as is usually the case at an exhibition of a new system. It should be remembered, however, that in this country the system has not been uniformly successful. At Denver a great deal of trouble was experienced, to the detriment of electric traction in that section of the country, and the system is not being rapidly introduced. The large number of contacts required, the possibility of some of them failing, the great danger of burning out the motors, with other possible objections, tend to make an unfavorable comparison with systems of greater simplicity.

THE PRICE OF COPPER. — The collapse of the copper syndicate should have an excellent effect on the extension of electric lighting and power distribution. The high price that has ruled in the last year has been very unfavorable to electric-light people, especially those using the low-tension system of distribution. It is to be hoped, however, that the change in the cost of copper will not bring up again the fierce discussions as to the relative merits of high and low potential distributions which ruled about a year ago. We can expect, however, that this year will see more than double the amount of plant installed than did last year.

NOTES AND NEWS.

SEVERAL large textile manufacturers of Paterson and other manufacturing centres are reported by *Bradstreet's* to be inaugurating a movement for the founding of a textile technical school. The object of the movement is threefold, — to elevate the character and improve the style of the American fabrics, to render the domestic manufacturers independent of European art and skill in the production of high-grade goods, and to secure independence of trades-unions. Negotiations are reported to have already been opened with qualified teachers from abroad to assume charge.

— As summer approaches, and so many of our readers are considering the possibility of spending some of their vacation time in Europe, it may be well for them to investigate the merits of the Cheque Bank as a custodian of their funds while travelling. This institution was established seventeen years ago in London, for the convenience of the travelling public, and numbers among its trustees some well-known men. The bank aims to furnish the traveller with an immediately available security equal in value to a Bank of England note, only safer to carry. Letters of credit are done away with, while upwards of two thousand banks and bankers throughout Europe are now cashing the checks issued by the Cheque Bank. The British Government accepts them in settlement of customs charges, and railroad companies frequently accept them in payment of fares, as do also hotels and store-keepers in some cases. The bank issues check-books, each containing ten checks, which can be drawn for any amount the purchaser may desire. A branch office has recently been opened in New York under the management of Messrs. E. J. Mathews & Co., at No. 2 Wall Street.